2. (once amended). The chimerical peptide-nucleic acid fragment according to claim 1, [characterized in that]wherein the nucleic acid consists of at least two bases.

3. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s 1 to] 2, [characterized in that]wherein the nucleic acid has a secondary structure.

4. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s 1 to 3]2, [characterized in that]wherein the nucleic acid has a palindromic sequence.

5. (once amended). The chimerical peptide-nucleic acid fragment according to claim 4, [characterized in that]wherein the nucleic acid may form a "hairpin loop".

6. (once amended). The chimerical peptide-nucleic acid fragment according to claim 5, [characterized in that]wherein the nucleic acid may hybridize with itself and may form an overhanging 3' end or 5' end ('sticky end').

7. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 6], [characterized in that]wherein the nucleic acid is a ribonucleic acid, preferably a deoxyribonucleic acid.

8. (once amended). The chimerical peptide-nucleic acid fragment according to claim 7, [characterized in that]wherein the nucleic acid has chemically modified 'phosphorus thioate' linkages.

9. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 8], [characterized in that]wherein the nucleic acid carries a reactive linkage group.

10. (once amended). The chimerical peptide-nucleic acid fragment according to claim 9, [characterized in that]wherein the reactive linkage group contains an amino function when the linkage agent contains an amino-reactive grouping.

11. (once amended). The chimerical peptide-nucleic acid fragment according to claim 9, [characterized in that]wherein the reactive linkage group contains a thiol function when the linkage agent contains a thiol-reactive grouping.

12. (once amended). The chimerical peptide-nucleic acid fragment according to claim 10 or 11, [characterized in that]wherein the linkage grouping present is bound to the nucleic acid via at least one C2 spacer, but preferably one C6 spacer.

13. (once amended). The chimerical peptide-nucleic acid fragment according to claim 12, [characterized in that]wherein the linkage grouping is localized at the 3' hydroxy/phosphate terminus or at the 5' hydroxy/phosphate terminus of the nucleic acid, but preferably at the base.

14. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s 10 to 13]12, [characterized in that]wherein defined nucleic acids, antisense oligonucleotides, messenger RNAs or transcribable and/or replicatable genes are linked with the 5' end and/or 3' end.

15. (once amended). The chimerical peptide-nucleic acid fragment according to claim 14, [characterized in that]wherein the nucleic acid to be linked contains chemically modified 'phosphorus thioate' linkages.

16. (once amended). The chimerical peptide-nucleic acid fragment according to claim 14[to 15], [characterized in that]wherein the gene be linked contains a promotor, preferably a mitochondrial promoter.

17. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 16], [characterized in that]wherein the signal peptide has a reactive amino acid at the carboxy-terminal end, preferably a lysine or cysteine, when the linkage agent contains an amino-reactive or thiol-reactive grouping.

18. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 17], [characterized in that]wherein the signal peptide carries a cell-specific, compartment-specific or membrane-specific recognition signal.

19. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 18], [characterized in that]wherein the signal peptide has a cell-specific, compartment-specific or membrane-specific peptidase cleavage site.

20. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 19], [characterized in that]wherein the peptide consists of the compartment-specific cleavable signal peptide of the human mitochondrial ornithine transcarbamylase, extended by an artificial cysteine at the C terminus.

21. (once amended). The chimerical peptide-nucleic acid fragment according to any one of claim[s] 1[to 20], [characterized in that]wherein the linkage agent is a bifunctional, preferably heterobifunctional cross-linker.

22. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 21], [characterized in that]wherein the linkage agent contains thiol-reactive and/or amino-reactive groupings when the signal peptide and the nucleic acid carry thiol and/or amino groups as linkage sites.

23. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 22], [characterized in that]wherein the linkage agent is m-maleimido-benzoyl-N-hydroxy-succinimide ester or a derivative thereof.

24. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 23], [characterized in that]wherein the molecule can overcome membranes with and without membrane potential by utilizing natural transport mechanisms.

25. (once amended). [The]A chimerical peptide-nucleic acid fragment in the form of a linear-cyclic plasmid, [characterized in that]wherein the plasmid comprises at least one

replication origin and that both ends of the nucleic acid portion are cyclized, at least one cyclic end having a modified nucleotide which via a linkage agent can be liked with a cell-specific, compartment-specific or membrane-specific signal peptide.

26. (once amended). The chimerical peptide-nucleic acid fragment according to claim 25, [characterized in that]wherein the nucleic acid portion further comprises at least one promoter, preferably a mitochondrial promoter, especially preferably the mitochondrial promoter of the light strand.

27. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[and 26], [characterized in that]wherein the nucleic acid portion further comprises transcription-regulatory sequences, preferably mitochondrial transcription-regulatory sequences.

28. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[-27], [characterized in that]wherein the transcription-regulatory sequences have at least one binding site of a transcription initiation factor.

29. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] Claim[s] 25[to 28], [characterized in that]wherein the transcription-regulatory sequences have at least one binding site for the RNA synthesis apparatus, preferably the binding site for the mitochondrial transcription factor 1 and the mitochondrial RNA polymerase.

30. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 29], [characterized in that]wherein the transcription-regulatory sequences are arranged in the 3' direction of the promoter.

31. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 30], [characterized in that]wherein the transcription is regulated by elements of the mitochondrial H-strand and L-strand transcription control.

32. (once amended). The chimerical peptide-nucleic acid fragment according to claim 31, [characterized in that what is called]wherein the 'conserved-sequence-blocks' of L-strand transcription act as transcription control elements.

33. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 32], [characterized in that]wherein the plasmid further comprises at least one transcription termination site.

34. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 33], [characterized in that]wherein the transcription termination site has a binding sequence of a mitochondrial transcription termination factor.

35. (once amended). The chimerical peptide-nucleic acid fragment according to claim 34, [characterized in that]wherein the transcription termination site has the binding sequence of a preferably bidirectionally acting transcription termination factor.

36. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 35], [characterized in that]wherein the replication origin is a mitochondrial replication origin, preferably the replication origin of the heavy mtDNA strand having at least one 'conserved sequence block'.

37. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 36], [characterized in that]wherein the plasmid further comprises at least one regulatory sequence for the replication.

38. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 37], [characterized in that]wherein the regulatory sequence for the replication is a mitochondrial sequence motif.

39. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 38], [characterized in that]wherein the plasmid further comprises a selection gene, preferably an antibiotic-resistance gene, preferably the oligomycin - or chloramphenicol - resistance gene.

40. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 39], [characterized in that]wherein the plasmid further contains a multiple cloning site which permits the expression of 'foreign genes'.

41. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 40], [characterized in that]wherein the multiple cloning site comprises recognition sequences for restriction endonucleases which do preferably not occur in another site of the plasmid.

42. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 41], [characterized in that]wherein the multiple cloning site is arranged in the 3' direction of the promoter and in the 5' direction of the transcription termination site.

43. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 42], [characterized in that]wherein the multiple cloning site is arranged in the 5' direction of the selection gene.

44. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 43], [characterized in that]wherein the nucleic acid fragment has (phosphorylated) ends capable of litigation.

45. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 44], [characterized in that]wherein the nucleic acid fragment has 'blunt ends' or overhanging 3' ends, preferably overhanging 5' ends.

46. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 45], [characterized in that]wherein the nucleic acid fragment has 4 nucleotides comprising 5' overhangs which do not have a self-homology (palindromic sequence) and are not complementary to one another either.

47. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 46], [characterized in that]wherein the ends of the nucleic acid fragment are cyclized via synthetic oligonucleotides.

48. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 47], [characterized in that]wherein the overhanging 5' ends of the two oligonucleotides are complementary to one differing end of the nucleic acid each.

49. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 48], [characterized in that]wherein two differing 'hairpin loops' are used for the cyclization, one being specific (complementary) to the 'left' plasmid end and the other being specific to the 'right' plasmid end of the nucleic acid.

50. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 49], [characterized in that]wherein the modified nucleotide is localized preferably within the 'loop'.

51. (once amended). The chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 25[to 50], [characterized in that]wherein the plasmid DNA is amplified enzymatically by suitable oligonucleotides which have at least one recognition sequence for a restriction endonuclease which occurs preferably in non-repeated fashion in the plasmid sequence.

52. (once amended). The chimerical peptide-nucleic acid fragment according to claim 51, [characterized in that]wherein the restriction endonuclease to be used generated overhanging ends, preferably 5' overhanging ends, the cleavage site being localized preferably outside the recognition sequence.

53. (once amended). The chimerical peptide-nucleic acid fragment according to claim 51[or 52], [characterized in that]wherein the restriction endonuclease is B*sa*I.

54. (once amended) A process for the production of a chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 53]or 25, [characterized by]comprising the following stages:

(a) reaction of a nucleic acid (oligonucleotide) containing a functional linkage group having a linkage agent,

(b) reaction of the construct of (a) with amino acids at the carboxy-terminal end of a peptide, containing a signal sequence, with the exception of a KDEL signal sequence, and

(c) optionally extension of the chimerical peptide-nucleic acid fragment of (b) by further DNA or RNA fragments.

55. (once amended). The process according to claim 54, [characterized in that]wherein the DNA in step (c) is a PCR-amplified DNA fragment containing the human mitochondrial promoter of the light strand (P_L) as well as the gene for the mitochondrial transfer RNA leucine ($tRNALeu^{UUR)}$).

56. (once amended). The process for the production of a chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 53]or 25, [characterized by]comprising the following steps:

(a) optional extension of the nucleic acid containing a functional linkage group by further DNA or RNA fragments,

(b) reaction of the nucleic acid with functional linkage group or the extended nucleic acid of (a) with a linkage agent,

(c) reaction of the construct of (b) with amino acids at the carboxy-terminal end of a peptide containing a signal sequence, with the exception of a KDEL signal sequence.

57. (once amended). The process according to claim 56, [characterized in that]wherein the DNA in step (a) is a PCR-amplified DNA fragment containing the human mitochondrial promoter of the light strand (P_L) as well as the gene for the mitochondrial transfer RNA leucine ($tRNALeu^{UUR)}$).

58. (once amended). [Use of]A method to use the chimerical peptide-nucleic acid fragment according to[any one of] claim[s] 1[to 53]or 25 for the appropriate nucleic acid introduction into cell organelles and cells, [characterized by]comprising reacting the fragment with cells or pretreated cell compartments.

59. (once amended). [Use]The method according to claim 58, [characterized in that]wherein the pretreated cell compartments are energized mitochondria.

60. (once amended). [Use of]A method of using the chimerical peptide-nucleic acid fragment according to[any one of] claims 1 [to 59]or 25 for the introduction into eukaryotic cells.

61. (once amended). [Use of a chimerical peptide-nucleic acid fragment]The method according to claim 60, [characterized by]comprising employing] the 'particle gun' system, electroporation, microinjection or lipotransfection for the introduction into eukaryotic cells.